

*ENVIRONMENTAL ASSESSMENT
OF THE
OPERATION AND MAINTENANCE
OF*

WEST THOMPSON LAKE

QUINEBAUG RIVER

THOMPSON, CONNECTICUT

Prepared by



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

JANUARY 1977

PREFACE

The purpose of this Environmental Assessment is to provide the basis for evaluation of the environmental impact on the project area due to the routine operation and maintenance of this flood control reservoir. West Thompson Lake has been operated whenever necessary since it was constructed to prevent or reduce downstream flooding. Maintenance and management of the project, including the recreation facilities, during non-flood periods is also of primary importance. Enhancement of the fish and wildlife resources as well as protection of the environment within and around the reservoir area has been given careful consideration.

TABLE OF CONTENTS

	<u>Page</u>
I. PROJECT DESCRIPTION	1
A. INTRODUCTION	1
B. STRUCTURES AND RESERVOIR	2
C. OPERATION PROCEDURES	3
II. GENERAL ENVIRONMENTAL SETTING	4
A. CLIMATE AND PRECIPITATION	4
B. TOPOGRAPHY	5
C. SOCIO-ECONOMIC CONDITIONS	6
III. ENVIRONMENTAL IMPACT OF THE OPERATION, MAINTENANCE, AND MANAGEMENT PROGRAM	6
A. DOWNSTREAM EFFECTS - REGULATION OF FLOWS AND RELEASES	6
B. PROJECT MANAGEMENT	7
C. VEGETATION	8
1. Description	8
2. Environmental Impact	9
D. FISH AND WILDLIFE	12
1. Description	12
2. Environmental Impact	13
E. GEOLOGY AND WATER QUALITY	15
1. Description	15
2. Environmental Impact	17
F. RECREATION	17
1. Description	17
2. Environmental Impact	18

TABLE OF CONTENTS (Continued)

	<u>Page</u>
IV. ALTERNATIVES TO THE OPERATION, MAINTENANCE AND MANAGEMENT PROGRAM	19
A. DISCONTINUANCE OF AUTHORIZED FLOOD CONTROL OPERATIONS	19
B. LAND MANAGEMENT ALTERNATIVES	19
C. OPERATION AND MAINTENANCE ALTERNATIVES - RECREATION	21
V. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERMS USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	22
A. SOCI-ECONOMIC EFFECTS	22
B. BIOLOGICAL COMMUNITIES AND ECOSYSTEMS	23
VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN THE OPERATION AND MAINTENANCE PROGRAM	24
VII. COORDINATION WITH OTHER AGENCIES	24

I. PROJECT DESCRIPTION

A. INTRODUCTION

1. Location and Authorization

West Thompson Lake is located in northeastern Connecticut in the town of Thompson, Windham County. The dam is situated on the Quinebaug River about one-quarter mile upstream from the confluence with the French River. The Quinebaug River, a tributary of the Thames River Basin, originates in south central Massachusetts. It flows southeastward out of Massachusetts into West Thompson Lake from which point it flows in a generally southerly direction to its mouth at the confluence with the Shetucket River above Norwich, Connecticut.

West Thompson Dam is an element of the flood protection plan for the Thames River Basin which was approved by the Flood Control Act of August 18, 1941, Public Law No. 228, 77th Congress, 1st Session. The development and use of reservoirs for public recreational and other purposes are authorized by the Flood Control Act of 1944, Public Law No. 534, 78th Congress, 2nd Session, as amended. The dam was completed in December, 1965, at a cost of \$6,980,000.

2. Purpose

The Corps of Engineers' comprehensive flood control plan for the Thames River Basin consists of six active reservoirs and one local protection project. As part of this program, the operation of West Thompson Lake provides flood protection to Putnam, Connecticut, and other downstream communities such as Danielson, Jewett City and Norwich. This

project also offers recreational opportunities compatible with the primary function of flood control.

B. STRUCTURES AND RESERVOIR

1. Dam and Appurtenant Structures

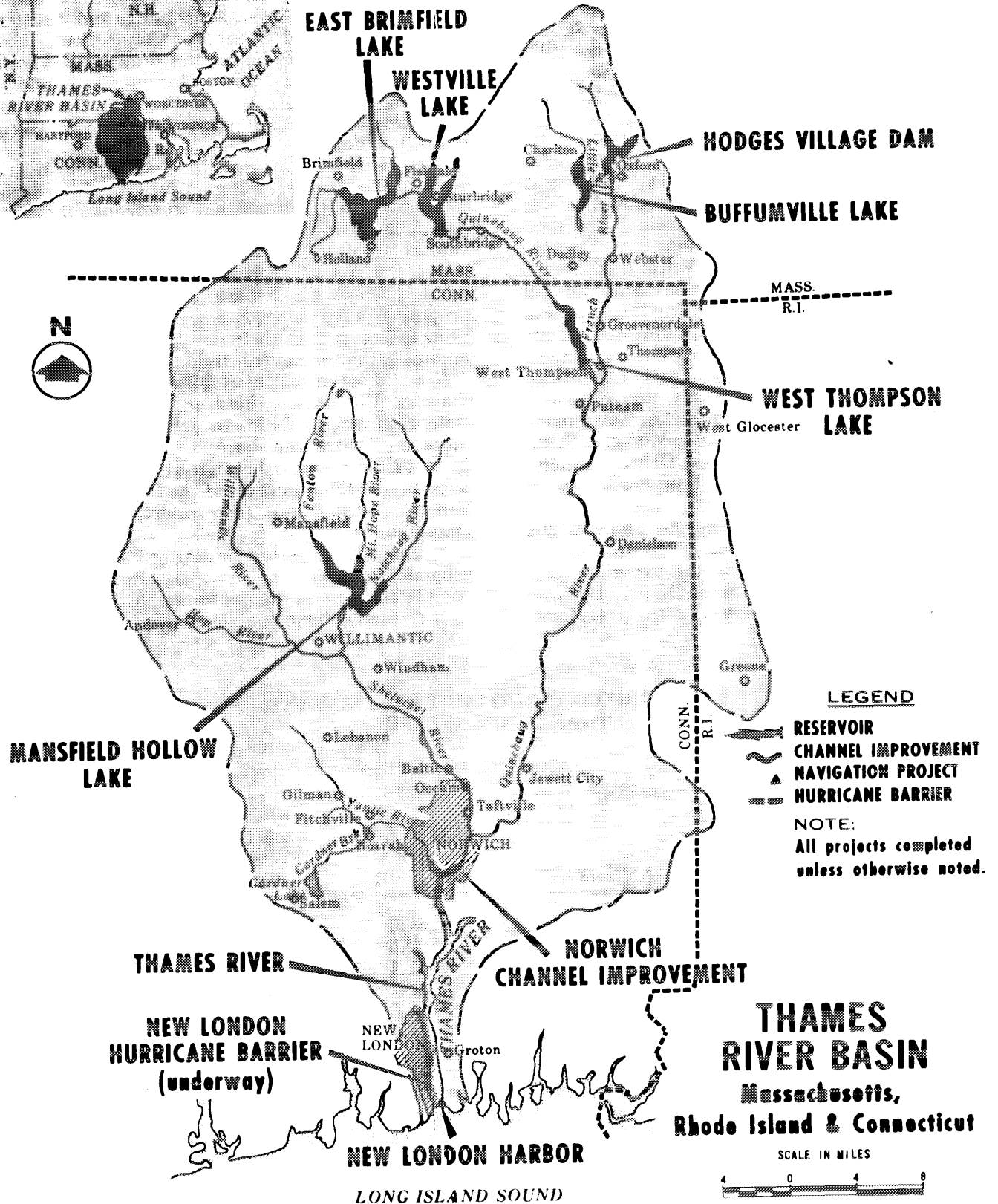
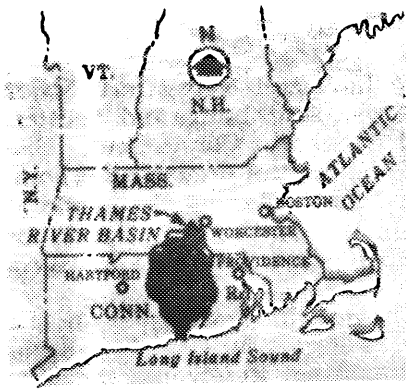
West Thompson Dam is a rolled-earth fill embankment 2,550 feet long, with a concrete ogee weir side channel spillway and a dike 600 feet long. The top of the dam at elevation 361.5 feet above mean sea level (msl) has a maximum height of 70 feet above the river bed. West Thompson Road passes over the top of the dam.

The spillway is an L-shaped concrete weir 320 feet long in the right abutment of the dam with a crest elevation of 342.5 feet msl. A 12-foot diameter horseshoe-shaped conduit with an invert elevation of 292 feet msl comprises the outlet works of the dam, located at the foot of the right abutment. Three 5' x 9' hydraulically operated slide gates control the flow through the outlet works. The channel immediately upstream of the outlet works includes a weir with provisions for stoplogs to maintain a conservation pool at elevation 305 feet msl.

2. Reservoir

West Thompson Dam creates a reservoir at spillway crest elevation 342.5 msl with a storage capacity of 25,600 acre-feet, which is equivalent to 6.5 inches of runoff from a net drainage area of 74 square miles. (The total drainage area is 174 square miles, but the upper 100 square miles are controlled by East Brimfield and Westville Dams). The reservoir, if filled to spillway crest, would have a water surface area of 1,250 acres and a maximum depth of 50.5 feet. At this elevation the reservoir would

NOTE: Delineation of streams on map is limited to major streams or to those having existing project or current study



extend up the Quinebaug River about 5 miles from the dam. The conservation pool with a surface area of 200 acres is maintained at an elevation of 305 feet msl throughout the year.

3. Dike

A rolled-earth fill dike 600 feet long is located in a saddle about 3,500 feet north of the left abutment of the dam. The top of the dike is at elevation 361.5 feet msl.

4. Real Estate

The project contains a total of 2,181 acres, of which all but the 63 acres of flowage easement have been acquired in fee. It consists of a cleared valley of present and former farmland flanked by a series of wooded hillsides. The surrounding area is mostly undeveloped woodland with some residential properties and a few farms and industrial plants. A few acres of woodland and strips of trees along the banks of the Quinebaug River were cleared for the present lake. Most of the easement property is at the north end of the reservoir and consists of a gravel pit and undeveloped land.

C. OPERATION PROCEDURES

Reservoir regulation at West Thompson Dam is coordinated with water level stages downstream on the Quinebaug River at Putnam and Jewett City. Coordination of regulation at all six dams in the Thames River Basin provides maximum flood protection. As part of the flood control program in the Thames River Basin, rainfall reports and snow surveys are made periodically to alert the Reservoir Control Center at the Corps' New

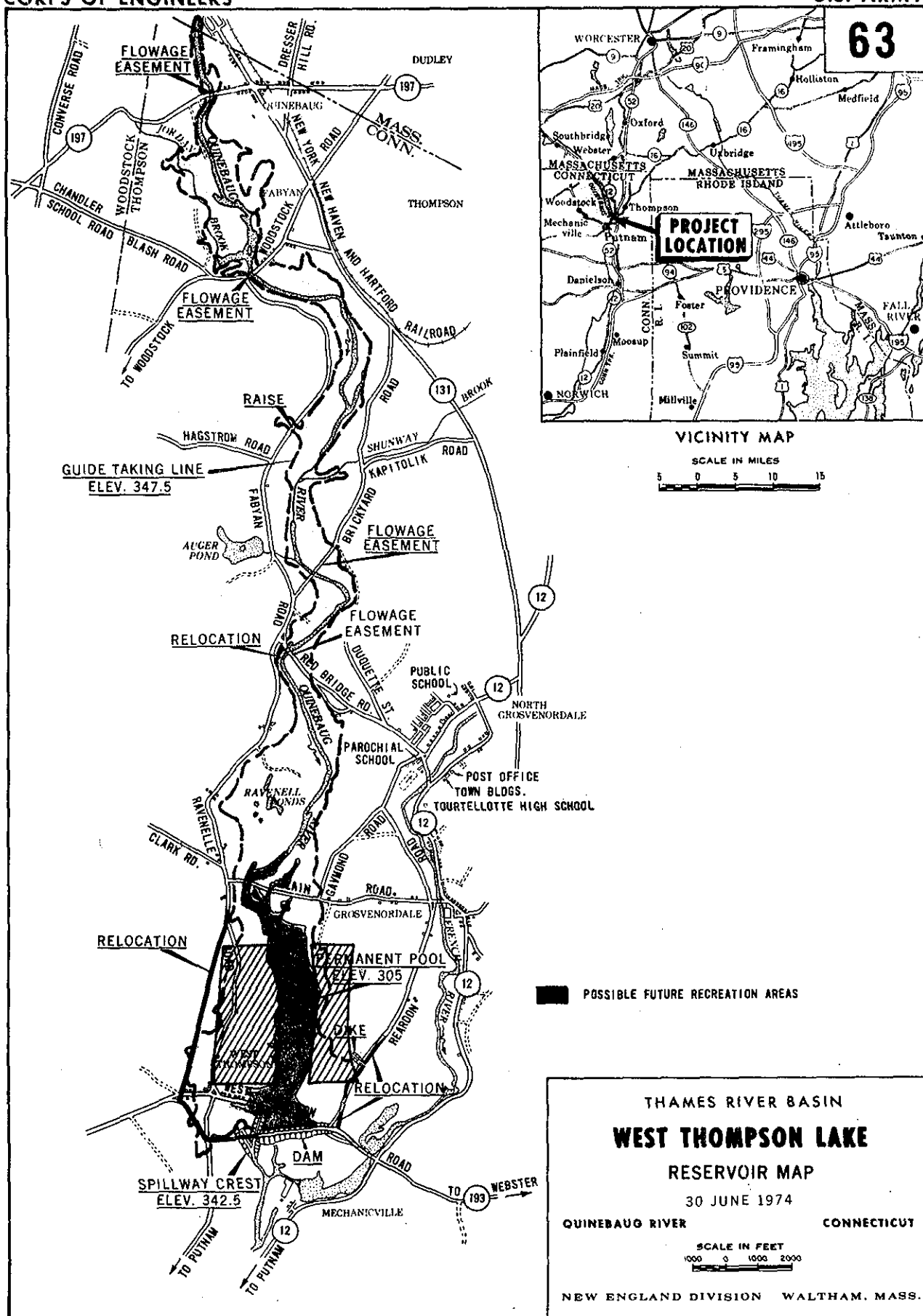
England Division Headquarters in Waltham, Massachusetts. Reporting networks have been established in cooperation with the National Weather Service, the U.S. Geological Survey and local authorities. Reports from network stations are received weekly during non-flood periods, daily during storm periods and as often as every three hours during severe storms. Because of rapid runoff in the basin, the emphasis has been on river stage recording stations, especially at damage centers downstream of reservoirs, in order to provide prompt information on flood conditions.

II. GENERAL ENVIRONMENTAL SETTING

A. CLIMATE AND PRECIPITATION

The Thames River Basin, including the Quinebaug subbasin and West Thompson Lake, has a variable climate characterized by frequent but short periods of heavy precipitation. The basin lies in the path of the "prevailing westerlies" and cyclonic disturbances that cross the country from the west or southwest to the east or northeast. The basin is also occasionally exposed to coastal storms, some of which originate in the tropics and may be of hurricane intensity, heavily laden with moisture from the ocean.

The average annual temperature in Putnam two miles below the dam is about 48°F. The southern part of the watershed has a generally milder climate than the northern part, due to the moderating influence of Long Island Sound. Average monthly temperatures range from 70°F in July to 26°F in January. Air temperatures sometimes reach 100°F in summer and rarely fall to less than -10°F in winter.



The average annual precipitation over the Thames River basin is about 44 inches. At Putnam it is about 45 inches. During 23 years of record, snowfall at Putnam has averaged about 45 inches, which is about one foot less than in northern parts of the basin. For the Thames River basin as a whole, the average annual runoff is 22.5 inches (1.64 cfs per square mile), or just over 50 percent of the average annual precipitation.

B. TOPOGRAPHY

The Quinebaug River, the largest tributary of the Shetucket, has its origin in several brooks at East Brimfield, Massachusetts, and flows southeastward to a confluence with the French River at Mechanicsville, Connecticut. From there it flows southwestward to the Shetucket River a short distance above Norwich. During spring freshets, the river rises moderately, and summer flow is well sustained by rainfall and ground water. Because of the generally hilly topography, runoff is fairly rapid throughout the Thames River basin.

The Quinebaug River has a total fall of 612 feet along a total length of 67.5 miles. In the vicinity of the reservoir the river's gradient is about 7.5 feet per mile. Hilly terrain with moderate relief surrounds the reservoir area. The river valley is steep-sided with terraces flanking the rather broad flood plain in some places. The flood plain has a few small swamps. Elevations in the vicinity range from 290 feet msl at the base of the dam to 640 feet msl at the top of Chandler Hill northwest of the lake.

C. SOCIO-ECONOMIC CONDITIONS

The town of Thompson is largely rural with a large proportion of land in woods, with agriculture concentrated in the river valley. Farming is a mixture of crops and livestock. The town's population has been increasing from 6217 in 1960 to 7580 in 1970.

Putnam is more industrialized, and it employs local residents and people from surrounding towns. Its industries and population are growing slightly. The town's population was 8412 in 1960 and 8598 in 1970.

The major industries (250 to 1000 employees each) whose facilities are in the Quinebaug River flood plain in Putnam are Hale Manufacturing Corporation, Belding-Hemenway, American Optical Corporation, and Putnam-Hertzel Finishing Company. There are six smaller firms as well. A very small fraction of the town's land is used for agriculture, mainly dairy farming.

III. ENVIRONMENTAL IMPACT OF THE OPERATION, MAINTENANCE, AND MANAGEMENT PROGRAM

A. DOWNSTREAM EFFECTS - REGULATION OF FLOWS AND RELEASES

The flood of record in the Thames River Basin occurred in August, 1955. Caused by the torrential rains of Hurricane Diane it produced damages estimated at \$62 million with 8 lives lost. Flood losses in the Quinebaug subbasin were \$37,420,000 of which \$4,820,000 occurred in Connecticut.

The Quinebaug River above the dam has steep valley sides conducive to rapid runoff and flooding at Putnam. The steep-sided valleys and moderate gradients of its tributaries above Putnam aggravate this situation.

Therefore, the dam is in a good location to reduce flood damage to Putnam and is a significant benefit to that city and to other downstream communities on the Quinebaug River. In a recurrence of the 1955 flood, the dam would prevent estimated damages of \$8,500,000. Since completion it has prevented estimated losses of \$1,200,000. West Thompson Dam has regulated flood flows every year since construction. The lake has been filled to more than 25 percent of capacity twice since 1968. The highest stage so far in the reservoir occurred in March 1968, after 3.8 inches of rain fell over a two day period. Snowmelt runoff occurred at the same time. The reservoir was filled to a depth of 37.5 feet or about 48 percent of capacity. The peak regulated outflow was 2,270 cfs, whereas the maximum inflow was about 6,000 cfs, discounting upstream control by other reservoirs. The stored floodwaters covered a total of 820 acres.

B. PROJECT MANAGEMENT

The Project Manager is responsible for the routine maintenance of the project, including clean-up of flood debris, trash, and litter.

The unleased property at West Thompson Reservoir consists mostly of unimproved land not actively managed for recreation or other purposes by the Corps of Engineers and requiring only minimum maintenance. All grassed areas and the dike are mowed as needed in the summer. The Corps uses a herbicide to kill weeds on the rock embankments of dikes, inlets and outlets. The Project Manager has a permit to use highly diluted simazine in spot applications on individual plants. The Corps has used no insecticides on the project.

Some of the leased agricultural acreage is used to grow corn and farmers commonly use herbicides and insecticides. No brush control is necessary at the reservoir. The Corps maintains the road and parking area for the administrative area and recreation facilities. The town of Thompson maintains all other roads around and across the reservoir, using a sand-salt mixture for winter de-icing. Aquatic weeds are not a problem in the lake.

C. VEGETATION

1. Description

About half of the land in the town of Thompson is wooded, but only about 30% of the reservoir property is, and much of that is above flood encroachment lines. The rest of the reservoir has been or still is farmland. Most of the woodland has a closed canopy, with trees of various sizes, indicating relatively recent regeneration following some previous use, such as agriculture or cutting. The predominating trees of the upland woods are white pine and white oak, usually accompanied by red oak, shagbark hickory and occasionally by gray birch, or yellow birch in moist depressions. In the lower wooded slopes and riverbanks, where wooded, red maple occurs with white ash, red and white oaks, white pine, gray birch, black birch and ironwood.

Little bluestem predominates in the meadows, with milkweed, asters, goldenrods, grasses, blackberries, aspen and staghorn sumac. In the wetter meadows little bluestem is usually absent, and red osier dogwood, meadowsweet and very small red maples are frequent. Scattered larger aspen, red oak, shagbark hickory and white pine also occur in many meadows.

The common species of the marshes are false nettle, giant reed, purple loosestrife and sensitive fern. The shrubby edges consist predominantly of speckled alder, meadowsweet, and small red maples.

At present, there is no active management of the woodlands in the project for wood production. The grass slopes below the dam have been planted with white pine. Some vegetation has been cleared for the picnic area, camping area, and boat ramp. Some dead trees have been removed from the meadow around old West Thompson Road on the east side of the lake. The Corps mows the grass areas above and below the dam and at the dike as needed during the growing season.

2. Environmental Impact

a. Downstream Effects

The primary objective of flood control operations at West Thompson Lake is to reduce flood stages at Putnam, Connecticut, and other downstream communities to non-damaging channel capacity or less. The direct result is a decreased frequency of bank overflow downstream from the reservoir. The area where these effects occur along the Quinebaug River between the dam and Putnam is flood plain, about 50% developed, 30% open land, and 20% woodland. Some of the steep slopes of the valley walls are also wooded. The steep woods were flooded only infrequently and briefly before dam construction. The changes in flow regimen caused by the dam will probably not noticeably affect the species composition of these woodlands. In contrast, the wooded flood plain was flooded frequently in the past and may now become drier. Probably the species

composition of the woodland canopy will not change noticeably, because most of the lowland trees occurring in this project can tolerate a range of hydrologic conditions. Changes in shrub and herb species composition may occur in the lowest spots which were normally inundated during floods and which are now deprived of floods to refill them. In effect, the dam has made the flood plain ecologically narrower. Below West Thompson Dam there are no large marshes or swamps to be so affected. In the flood plain below the dam there is now also a smaller ground surface area from which floods annually or frequently wash out herbaceous plants and small woody seedlings, leaving bare ground between larger trees and shrubs until late spring or summer. Since the dam outlet will keep downstream discharges at or below channel capacity, these effects are now confined to the outer edges of the channel.

b. Upstream Effects

The permanent pool or lake covers 200 acres, much of which was formerly farmland. Therefore, not much clearing of trees was necessary for the lake beyond strips along the riverbanks and along the base of the hillsides. A combination of rather steep wooded hillsides and flat to sloping meadows surrounds the lake. The vegetation of the meadows around the edge consists of species which tolerate annual flooding and wet conditions. The tree species of the hillsides have not suffered noticeably from flooding which, in general, has caused little tree mortality. One reason is that most of the rather steep slopes drain well. Furthermore, after a flood the reservoir storage is released as

fast as possible. The higher wooded slopes are flooded only rarely. However, many shrubs were killed in the woods in February 1970, when the lake level rose and the surface subsequently froze. Herbaceous woodland plants may also be damaged by flooding because their small root systems are more easily dislodged by moving water during drawdown than the larger root systems of woody plants. In the flatter meadows, oxygen starvation of roots is a more serious stress for plants than uprooting, because the floodwaters rise and recede slowly. Summer floods cause more damage from oxygen starvation than winter or early spring floods, because dormant vegetation has a lower rate of respiration. The largest floods to occur since the dam was built have all taken place in winter or early spring, so that oxygen starvation stress has not yet been a serious effect.

A major flood could damage reservoir facilities and vegetation and would leave debris in the reservoir area. The degree of unavoidable adverse effect will vary with both the extent and duration of floodwater impoundments. Standard reservoir regulation procedures prescribe that emptying of the reservoir should begin as soon as the flood levels begin to recede at the specified downstream checkpoint of Putnam. In this way, flood waters are impounded for the shortest possible time with the least possible damage to vegetation. The only corrective maintenance that needs to be done after such a flood is repair of any damaged facilities and clean-up of debris around the dam and recreation areas.

c. Agriculture

The Corps leases a total of 640 acres in 13 parcels to local farmers for grazing and crops. The potential economic impacts of flooding could include delayed planting from spring flooding, crop damage during the growing season, and loss of use of pasture for livestock.

d. Forest Management

At present there is no active forest management in West Thompson Reservoir, and a number of conditions make forest management for timber impractical. Much of the woodland in the project is on rather steep slopes, where extensive cutting would promote erosion. The largest wooded areas are the locations of the camping area and the picnic area. The selective cutting for these uses could yield a small amount of valuable oak and white pine. Some smaller wooded areas are in the flood plain on low hills where they are subject to flood damage, which would make investment in wood production unprofitable.

The white pines planted below the dam are an appropriate species, since they predominate with oaks in the surrounding woodlands.

D. FISH AND WILDLIFE

1. Description

The Quinebaug River reaches a rather flat valley just north of the dam site at West Thompson. Vegetation on the west side of the river consists mainly of meadow grasses with some trees along the edge of the recreation pool. There are more woods on the east side of the lake. The wide shallow basin is excellent habitat for many aquatic species and other wildlife. Some of the species that are rather common to this

habitat are raccoon, muskrat, fox, opossum and possibly mink and river otter. A few deer have been noted in the area. Some of the avian species seen in the area include black duck, wood duck, mallard, geese, occasionally mergansers, red-tailed hawks, species of owls, great blue and little green herons, wintering herring gulls, grouse, pheasant, mourning doves, many species of sparrows, warblers and other songbirds.

The wetlands habitat provides essential living requirements for a variety of reptiles, amphibians and fish. Some of these species include snapping turtle, spotted turtle and painted turtle. Snakes include northern water snake, garter snake, milksnake and northern black racer. Some of the amphibians present include toad, spring peeper, bullfrog, green frog, wood frog, pickerel frog and leopard frog.

Many of the amphibians are prey to chain pickerel and large-mouth and small-mouth bass that exist both in the river and lake. Horn pout and bluegills are frequently caught in the lake.

The Connecticut Department of Environmental Protection maintains a bird stocking program at the West Thompson Reservoir. At the present time, pheasant are the only wildlife released there. Several hundred birds are stocked each year. The State does not stock fish in the Quinebaug River because it is too polluted. Some individuals also trap muskrat within the reservoir area.

2. Environmental Impact

a. Downstream Effects

When natural flooding is reduced due to reservoir operations, some alteration of aquatic and terrestrial ecosystems will occur downstream.

Artificially modified flood patterns below West Thompson Dam have decreased the formerly flooded area, so that there is less aquatic productivity there than before dam construction. Wetlands, even temporary ones, are important to the life cycles and habits of many species of wildlife, waterfowl, and fish. They promote insect production and diversity of vegetation which in turn supply food for a variety of fish and birds. Modification of these areas, by controlling floods affects the entire food chain of wildlife species, from aquatic invertebrates to spawning fish. The reduced available aquatic and wetland habitat below the dam leads to reduced numbers of aquatic and wetland animals, however, the area no longer flooded can become terrestrial wildlife habitat if it is not developed.

b. Upstream Effects

The impact of West Thompson Dam to date has had no major detrimental effects on the wildlife. However, the effect of flood storage on the area is significant during the breeding season. For example, during May and June marsh-nesting birds are rearing young and insectivorous birds are highly dependent on a steady insect population in the marsh. Emerging aquatic insects are consumed by many birds as well as mammals, reptiles, amphibians, and other insects. Any unnatural change in the water level at this time could affect the breeding success in the lake and marsh ecosystems.

E. GEOLOGY AND WATER QUALITY

1. Description

The bedrock underlying the dam and reservoir is metamorphic gneisses and schists. The river flows over a thin veneer of alluvium composed of silt, sand, and gravel in a narrow flood plain. The valley and terraces are underlain by ice-contact stratified drift with up to forty feet of saturated thickness in the center. The hills beyond are underlain by till and bedrock.

The flood plain and terraces are the most suitable land for most human uses because they are flat or gently sloping, however, flooding could be a problem in the flood plain if development occurs. The slope of the steep hillsides is too great for intensive development.

The unconsolidated materials in the terraces and flood plain are well drained except for swamp deposits. Drainage ranges from good to poor in the soils of the hillslopes underlain by till. Bedrock at or near the surface is a hindrance to development because it interferes with drainage, cultivation, and excavation. The coarse-grained stratified drift in hills and terraces beside the flood plain is a potential source of sand and gravel.

The ice-contact stratified drift in the Quinebaug River valley is a potentially good source of ground water. The highest-yielding part of the aquifer is north of Red Bridge Road, where coarse-grained stratified drift predominates in the valley. It will yield 100 to 1000 gallons per minute to a properly sized and screened well. Fine-grained stratified drift predominates between Red Bridge Road and the dam. Its potential yield to wells is less than 100 gallons per minute.

The Quinebaug River, in the reservoir area, is presently classified as Cc by the State of Connecticut. Class Cc water is suitable for cold water fish and wildlife habitat, recreational boating and certain industrial processes and cooling. It cannot contain less than 5 mg/l of dissolved oxygen at any time and the total coliform bacteria cannot exceed an average of 5,000 colonies/100 ml in any 30 day period.

The Corps has been periodically sampling the Quinebaug River in the reservoir area since 1971. To date, the mean dissolved oxygen concentration measured at the inflow upstream from the dam is 9.7 mg/l; it has never been measured below 5.0 mg/l. The mean dissolved oxygen concentration discharged from the reservoir is 9.6 mg/l. The outflow water has never been measured below 5.6 mg/l in concentration. The policy of drawing water from the bottom of the reservoir, as well as from the top, reduces any oxygen depletion which might occur in the 13 foot deep reservoir during the summer.

Prior to March 1975, total coliform bacteria measurements were collected infrequently at the project because no water contact recreation was allowed in the reservoir area. Five inflow total coliform bacteria counts analyzed on three surveys averaged approximately 4,100 colonies/100 ml, ranging from 10 to 10,000. Eight discharge total coliform bacteria counts analyzed on 8 surveys averaged approximately 2,800 colonies/100 ml, ranging from 0 to 11,300. Concentration fluctuations of total coliform bacteria within the reservoir reach of the Quinebaug River vary erratically from one sampling date to another, however, this is not related to the Corps operation of the project.

Abnormal concentrations of total phosphates, nitrates, turbidity and chemical oxygen demand (COD) are also occasionally encountered.

2. Environmental Impact

The general water quality of West Thompson Lake is not significantly changed by flood control operations. The water temperature at the dam outlet is higher in the summer than the temperature of the inflowing river because the lake is shallow and flows slowly. Water stored in the lower levels of the reservoir may be depleted of some dissolved oxygen, because high flows bring organic, oxygen-demanding materials into the reservoir and plant debris falls into the lake from the shoreline vegetation. However, data collected to date indicate that the turbulent conditions at the dam outlet aerate the water sufficiently, thus preventing any depletion of oxygen levels downstream.

F. RECREATION

1. Description

The Corps of Engineers operates and maintains all the recreational facilities at West Thompson Lake. The recreational activities available include camping, snowmobiling, boating, fishing, hunting, trail bike riding, sightseeing and picnicking. Current water quality conditions prohibit water contact recreation. There is one boat launch area on the west side of the lake a short distance upstream from the dam, and another boat ramp is located near the camping area. This ramp is part of a combination day-use and camping area called the Reardon Road Recreation Area. In conjunction with the campground is a picnic area,

complete with a picnic shelter for larger groups. The camping area is composed of 25 sites for trailers and tents, which can accommodate approximately 100 people. There are also two adirondack shelters available for the campers. The area has restrooms with flush toilets and showers.

2. Environmental Impact

Recreational use of West Thompson Lake is necessarily subordinate to authorized flood control operations and occasionally is reduced by them. The location of the camping area is not in conflict with flood control because it is above the flood encroachment line. However, the boat launching, picnic and some parking areas could be flooded. Also, two town roads must be closed when flooding is imminent. The Corps is responsible for flood inspection, clean-up and repair of flooded recreational facilities. Debris and damage to facilities can be removed or repaired fairly rapidly. However, a flood control reservoir after drawdown of the flood pool can be unsightly. Mud, debris and dead and damaged vegetation which sometimes result from flood storage operations appear unsightly to many people until cleaned up.

Two difficult aspects of managing public land for recreation are preventing abuse and resolving conflicts in uses. The facilities built for public use are located in one area on the east side of the lake above the dam. This location makes it easier to monitor recreational activities. All of the reservoir, except for leased farmland and facilities associated with operation of the dam, is presently open to the public free of charge. The only restriction to public access is the closing of two lowlying roads when flooding is imminent.

IV. ALTERNATIVES TO THE OPERATION, MAINTENANCE AND MANAGEMENT PROGRAM

A. DISCONTINUANCE OF AUTHORIZED FLOOD CONTROL OPERATION

If West Thompson Dam ceased operation, there would be no flood storage capacity for 74 square miles of Quinebaug River drainage area above Putnam. Large floods would jeopardize the City of Putnam and other downstream developments in the flood plain. Discontinuance of flood control is not economically sensible and would not be unless all development in the downstream flood prone areas were removed and future development prohibited. Since many communities depend in various ways on proximity to the river for their economic stability, the need for the Corps' structural control will continue due to the ever present possibility of large floods.

B. LAND MANAGEMENT ALTERNATIVES

1. Single Purpose Versus Multiple Use Management

The Corps of Engineers policy in managing its reservoirs is to allow for optimum public use consistent with flood control objectives. However, the various types of management programs suitable for a given project depend in part on such factors as: geographic location, topography, frequency, duration and extent of reservoir flooding, supply of and demand for various forms of land and water oriented recreation, and compatibility of different land and water uses with one another. These physical constraints will determine the suitability of an area for one use alone or for many coexisting uses which can be managed simultaneously.

Multiple purpose resource management has come to be accepted by all public agencies as a necessary response to the need for obtaining optimum use of public land. In view of the economic desirability of flood control, single-purpose management for any other purpose is not considered feasible. However, West Thompson Lake has natural resource values which would be, in effect, wasted if the project were managed solely for flood control.

2. Conservation and Recreation

The Thames River watershed in northeastern Connecticut is becoming an urban backyard for the major cities of the northeast. The undeveloped land at West Thompson Reservoir can be preserved in this state for the future, because it is required for flood control, thus serving as a measure to satisfy the ever demanding need for open space.

The upper part of the reservoir is already used for agriculture and is, therefore, productive for man. Only the land around the lake is available for other uses. It is therefore important that planning for optimum use of this area be considered. The area of Blain Road, north of the lake should be left untouched, since it is excellent habitat for wildlife. The recreation activities presently accommodated at West Thompson Lake are compatible with flood control operations, and in most cases, do not conflict with each other. (Trail bikes may be the only exception if they venture out of designated areas).

The public's recreational demand and the natural resources of West Thompson Reservoir are the primary reasons for continuing multiple rather

than single purpose use of this public property. Because this land must be left undeveloped for flood storage, it is preserved from potential diversion to more profitable uses. Since it is being managed as natural open space, its use for recreation and conservation is compatible with flood control objectives.

C. OPERATION AND MAINTENANCE ALTERNATIVES - RECREATION

Section 4 of the 1944 Flood Control Act (Public Law 534, 78th Congress) authorized the construction, maintenance, and operation of public park and recreational facilities at flood control reservoirs. Since that time part of the Corps' responsibility has been to make provisions for various recreational uses compatible with primary flood control objectives. The large numbers of visitors to the project (about 90,000 annually) indicate that the recreational opportunities offered are popular and needed. Therefore, the discontinuance of operation and maintenance of the recreational facilities would deprive users of recreational opportunities. Furthermore, the reservoir property on the east side of the lake where most recreation facilities and activity will occur has less natural environmental value than the opposite side. Therefore, wildlife and aquatic life would not benefit as much from abandonment of recreation on the east side as from the preservation of their habitat on the west side.

Leaving the west side undisturbed for the benefit of wildlife and plants would maintain the present balance on the property between undeveloped open space and relatively high intensity recreation, thus

responding to the necessity for both. This course of action is also prudent, because the west side meadow is lower and more frequently flooded than the recreation facilities on the east side.

V. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

A. SOCIO-ECONOMIC EFFECTS

Most flood control projects have been developed in response to an immediately perceived need to protect valuable land uses from harmful flooding. Usually the response has occurred after some critically damaging flood. In these cases, hindsight tells us exactly where flood control is necessary and to what extent.

West Thompson Dam would prevent \$8,500,000 worth of damage in a recurrence of the 1955 flood and has so far prevented flood damages of \$1,200,000. In a city like Putnam, which this dam protects, the damage is particularly costly. Not only is there direct loss, but also jobs are lost or suspended, and the whole economy of the affected community suffers. The period of reconstruction creates hardships for families of the jobless, as well as for people who provide services to them.

The city of Putnam has industrial and commercial enterprises, and residences in the Quinebaug River flood plain. This past development eliminated natural flood storage areas, reduced the river's hydraulic efficiency, and resulted in construction directly in the path of floods. Yet such development has been economically beneficial to the communities. Therefore, the flood protection offered by West Thompson Dam may contribute to the city's continued economic stability and the region's long-term economic productivity.

The dams in the Thames River basin were designed to protect development already in the flood plain and not necessarily new construction. Unfortunately, communities below West Thompson Dam have generally made no plans to limit further flood-plain development or otherwise regulate flood-plain use to be consistent with the river's hydraulic efficiency and with ecological goals. Methods of long-term environmental planning are being developed to deal with the above problems, but in many cases clear channels for implementation and/or enforcement have yet to be defined.

West Thompson Reservoir has met some of the local and regional demand for several kinds of recreation including picnicking, camping, hunting, fishing, and snowmobiling. The continued provision of these recreational opportunities is a long-term benefit which will help to meet the large projected demand for the available forms of recreation.

B. BIOLOGICAL COMMUNITIES AND ECOSYSTEMS

The upstream effects of the dam on biological productivity are in part related to flooding and in part to water quality. Unless, or until, the Quinegaug is cleaned up, a stable, highly productive aquatic ecosystem will not develop in the reservoir to replace the agricultural productivity lost in formation of the lake. Downstream land-use regulation restricting flood plain development could help to maintain and perhaps also restore, the biological productivity and ecological diversity which have been forfeited for the unrestricted economic development of flood-prone lowlands. The State of Connecticut's Inland Wetlands Act, flood-plain zoning act and flood encroachment lines, where established, are constructive steps in this direction.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN THE OPERATION AND MAINTENANCE PROGRAM

In addition to the 200 acres of vegetation removed or inundated due to the permanent pool, there has been damage to vegetation from flooding. A few trees near the edge of the lake have died, and shrubs at higher elevations were damaged and killed in a high-water freeze in 1970. Frequent flooding has not caused many changes in the plant species composition of the lake shore. An average of about 300 acres above the lake will remain in a state of continual recovery from the effects of nearly annual flooding.

Wildlife within the reservoir may suffer from flood control operations. At the time of construction, most of the 2,181-acre project was farmland or woodland and meadow and supported a variety of terrestrial animal species. Along with the loss of terrestrial habitat in the impoundment, there may occasionally be some direct losses from drowning.

VII. COORDINATION WITH OTHER AGENCIES

Coordination with various State and local interests resulted in valuable input to this assessment. Meetings and correspondence as well as reports, suggestions, and research data proved to be very helpful. The following is a list of the several interests with whom coordination took place:

Connecticut Department of Environmental Protection
Northeastern Connecticut Regional Planning Agency
U.S. Department of Interior

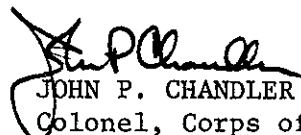
Upon evaluating the material presented in this Environmental Assessment, it is my belief that continued operation, maintenance and management of the West Thompson Lake flood control project is in the best public interest. To discontinue operation of this project could cause serious flooding downstream of the dam with significant property damage. Public recreation opportunities provided at the project would also be lost if management of the area ceased.

Environmentally, the operation, maintenance and management of West Thompson Lake has only a minor impact. The downstream aquatic and terrestrial ecosystems have been altered somewhat due to reduced natural flooding. Impoundment of flood waters in the reservoir has minimal effects on fish reproduction, wildlife habitat and vegetation since the duration of inundation is usually rather short and often at non-critical times of year.

Therefore, since the environmental impacts of continued operation, maintenance and management of the West Thompson Lake Flood Control Reservoir are minor, a formal environmental statement is not required under the provisions of the National Environmental Policy Act of 1969.

It is my opinion that the public will best be served by continuing operation of West Thompson Lake.

4 January 1977
(date)


JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer